

FD10™ PHASE COUPLER / FILTER



USER MANUAL

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SAFETY WARNINGS

- The wiring of your electrical installation is live (230 V) and extremely dangerous. Never connect the module when plugged into the mains. Always turn off the main switch before starting the installation.
- This product is for professional use and should be installed by a certified installer.
- To prevent short circuits, this product should only be used inside and only in dry spaces. Do not expose the components to rain or moisture. Do not use the product close to a bath, swimming pool etc.
- Do not expose the components of your systems to extremely high temperatures or bright light sources.
- Do not open the product: the device may contain live parts. The product should only be repaired or serviced by a qualified repairman.
- In case of improper usage or if you have opened, altered and repaired the product yourself, all guarantees expire. Haibrain does not accept responsibility in the case of improper usage of the product or when the product is used for purposes other than specified. Haibrain does not accept responsibility for additional damage other than covered by the legal product responsibility.
- This product is not a toy. Keep out of reach of children.
- Automatic switching devices provide comfort, but can also be dangerous. They can surprise people or can ignite clothing hanging over an electric heat source. Please be careful and take appropriate measures to avoid accidents.

HOW DOES HAIBRAIN X-10 WORK?

Haibrain X-10 components use the existing mains wiring to communicate (using Haibrain X-10 signals). You can build a complete system using the three different kind of components of the Haibrain X-10 System:

- 1. Modules:** These components will receive Haibrain X-10 signals and will switch or dim the attached lamp or appliance.
- 2. Controllers:** These components will transmit Haibrain X-10 signals and thus will control the Modules.
- 3. Transmitters:** Wireless components like remotes. The signals of these components will be received by a controller with transceiver functionality (IRRF 7243, TM13 or console of a Haibrain Security System). The Transceiver will translate the signals into Haibrain X-10 signals on the power line.

ADRESSES

Up to a maximum of 256 different addresses can be preset. These are subdivided into a so-called HouseCode (A to P incl.) and a UnitCode (1 to 16 incl.). The HouseCode can also be set on the controllers, so that the controllers and modules become part of the same system. The address can be set either using code dials or by pressing buttons, depending on the type of module.

The Haibrain X-10 System uses standard commands, which control all units with the same HouseCode at the same time (e.g. all lights on, all off, etc.).

SIGNAL RANGE

Range of Haibrain X-10 signals over the Power Line and how to increase the range.

The Haibrain X-10 System is based on power line communication. The range of the Haibrain X-10 signals very much depends on the local circumstances. On average the range is a cable length of 80 meters.

If you have difficulties with the range of your Haibrain X-10 signals, please pay attention to the following facts:

1. When more than one phase is used for your electrical system, it is necessary to couple these phases for the Haibrain X-10 signals. For coupling you can use FD10 Phase Couplers/Filters. You only need to install a Phase Coupler/Filter when your wall outlets and light switches are divided over more than one phase (more than one group is no problem). For bigger buildings or longer distances we advice you to use an active repeater instead of passive FD10's.
2. It is possible that Haibrain X-10 signals are attenuated by devices and lights which are connected to the power line. In a normal home situation this effect is negligible (the Haibrain X-10 system is using active gain control to eliminate the effects). However, it is possible that a particular device in your house is attenuating the signals so much that the range of Haibrain X-10 signals is decreased significantly. When you have range problems, it is wise to try to locate the device which is attenuating the signals simply by unplugging devices from the power line, and testing the differences in range for your Haibrain system.

When e.g. your conclusion is that e.g. your computer monitor is attenuating the signal, you can use a FM10 Plug-in Filter between the power line and the monitor to eliminate the effects.

Known devices which can cause attenuation are:

- PC Monitors
- PCs with heavy internal power supplies
- Old Televisions
- Copiers
- Fluorescent Lights
- Gas Discharge Lamps (Energy Saving Lamps)

3. Some (old) devices are able to disturb the signal by transmitting noise on the power line. Because the Haibrain X-10 signals are transmitted on 120 kHz, only noise on or near this frequency will have influence on the range. When you use a FM10 Filter to connect this device to the power line, the noise will be filtered.
4. The Haibrain X-10 protocol has several mechanism to avoid modules to be switched on or off by other sources than your Haibrain X-10 Controllers. However, it is possible that the Haibrain X-10 signals are disturbed by e.g. baby phones which are in TALK mode (continuous transmission). When these kind of signals are present on the power line it is possible that the Haibrain X-10 signals will not come through.
5. The mains do not stop at the front door of your home. Everything that is attached to mains nearby your home can have influence on Haibrain X-10 signals (e.g. heavy

machinery). If you think that your system is influenced by devices out of your house, it is advisable to install FD10 Phase Coupler/Filter on each phase entering the house. These filters will block signals coming into or going out of your house, but will also match the impedance for the mains. Hereby make your house Haibrain X-10 compatible for these units. The FD10's will not only filter but will also couple the phases (please see 1).

INSTRUCTIONS FOR USE

Congratulations on your purchase of the Haibrain X-10 FD10 Phase Coupler/Filter.

The FD10 Phase Coupler/Filter;

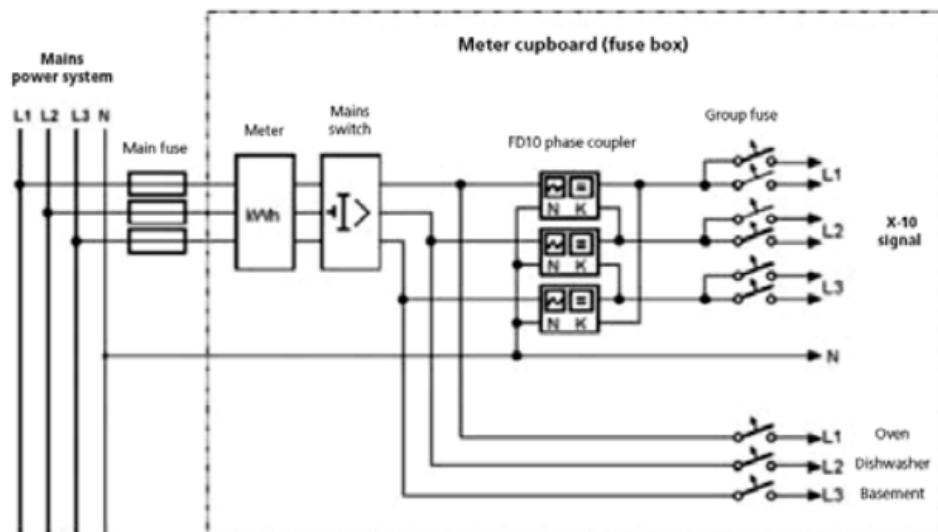
- connects Haibrain X-10 signals over phases for the use of the Haibrain X-10 system in a multiple phase installation.
- filters Haibrain X-10 signals from the mains to prevent signals from coming into or going out of the premises.
- amplifies the transfer of signals within the premises through impedance adjustments.
- can be applied to disconnect interferences from interference sources from the mains (heavy machinery, etc).

Heavy version: 63 A, 230 V.

INSTALLATION

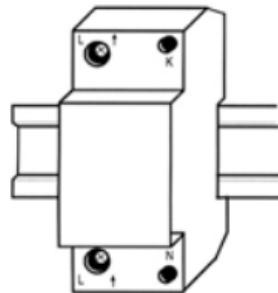
MAKE SURE THE MAINS ELECTRICITY IS SWITCHED OFF BEFORE INSTALLING THE MODULE!

The module must be installed by a qualified electrician!



The FD10 Phase Couplers/Filters can be placed directly after the main switch of the installation. In order to connect the FD10 properly, phase (L) and null (N) must be available. If multiple Filters are used in a multiple phase system, the Couplers/Filters must be connected to each other via a single wire connection.

The installation diagram shows how the FD10 phase coupler has to be installed: in between the current remaining mains switch for the electrical system and the fuses for the separate groups.



Simply click the FD10 onto the DIN rail.
Connect the cables as follows:

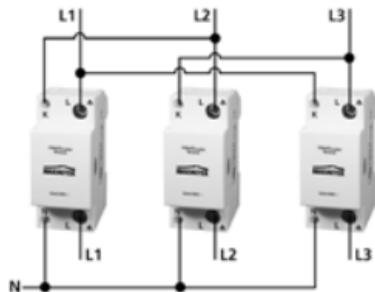
Phase input to (L↑)

Null to (N)

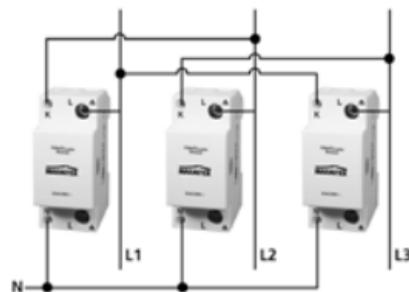
Phase output to (L↓)

Use additional Phase Couplers/Filters for installations with more than 1 phase. For the complete coupling of three phases you will need three FD10 Phase Couplers/Filters. Connect the filters by connecting connector K to the following phase (see figure). For this, a 1.5 mm² shift cable can be used.

Installation diagram



Coupling with filtering



Coupling without filtering

Attention: If micro modules are used that can only generate an X-10 PLC signal at 0 and 180 degrees (such as the LWM1, TMA4, TMD4 and AWM2), you will only be able to use the Phase Couplers/Filters as a filter. In order to couple the phases a CAT3000 will be required.

FREQUENTLY ASKED QUESTIONS

What is the reason for modules to switch on/off spontaneously?

It is possible that a Haibrain X-10 System is installed at one of your neighbours using the same House Code. To solve this problem try to change the House Code of your system.

Must the FD10 be placed before or after the earth switch?

In general the FD 10 can be connected best after the three phase main switch of a 400 V group (for instance the cooker group). When earth switches are used the FD10 must be installed before these switches. By doing so undesired switching off of these switches is prevented.

How many FD10 units do I need in my house for phase coupling?

For a 1-phase system: 0 FD10 modules are necessary.

For a 2-phase system: 1 FD10 modules are necessary.

For a 3-phase system: 3 FD10 modules are necessary or a CAT3000 (product info CAT3000). When using MicroModules (product info MicroModules) always use the CAT3000.

Can I also use MicroModules if I have FD10 modules?

Yes, the only thing that will not work, is the transmission function (2-way communication, status indicator) of the AWM2, TMA4, TMD4 and the LWM1. The AW12 and LW12 have no 2-way communication and will work normally. If you want to use 2-way communication, you need to use the CAT3000 for coupling.

Do the FD10 units need to be attached to the phase circuit? Not necessarily. If you only want to couple and not filter, the FD10 units can also be attached to the phases via a parallel connection. This makes the installation a lot simpler.

After placing the FD10 units, my installation does not work as well as before. What went wrong?

The FD10 units were not connected properly. The ingoing and outgoing phases were switched round, which means the FD10 suppresses the signals on the installation in your house.

Can I use the FD10 also as a filter only?

Yes you can. Use the wiring diagram as in "Coupling and filtering", but disconnect the K-connection.

What is the difference between 3 FD10s and the CAT3000?

When using 3 FD10s, the signals are spread over different phases (the phases are coupled). The CAT3000 couples the phases and also amplifies the signal (repeater) and also couples the extra MicroModules signals.

What tricks and tips can I use to enhance the reach of the X-10 signals?

See <http://www.haibraincom/en/support/haibrain-university.php> for more information.

Do you still have questions? Please check out <http://www.haibrain.com>. for more information.

TECHNICAL SPECIFICATIONS

Supply voltage:	230VAC, 50 Hz
Maximal current:	63 A
Central filter frequency:	120 kHz
Bandwidth filter:	5 kHz min. (3 dB points)
Attenuation incoming:	20 dB min. for $I = 0$ A
	15 dB min. for $I = 63$ A
Attenuation outgoing:	15 dB min.
Input impedance:	20 Ohm min. for $f = 120$ kHz
Coupling loss:	2 dB max. for $f = 120$ kHz
Connectors:	Screw connectors for phase (supply), phase (premises), null and connection.
Surrounding temperature:	-10°C to +50°C (business premises) -20°C to +70°C (warehouse)
Measurements:	35x80x65 mm



Environmental Information for Customers in the European Union

European Directive 2002/96/EC requires that the equipment bearing this symbol on the product and/or its packaging must not be disposed of with unsorted municipal waste. The symbol indicates that this product should be disposed of separately from regular household waste streams. It is your responsibility to dispose of this and other electric and electronic equipment via designated collection facilities appointed by the government or local authorities. Correct disposal and recycling will help prevent potential negative consequences to the environment and human health. For more detailed information about the disposal of your old equipment, please contact your local authorities, waste disposal service, or the shop where you purchased the product.

DECLARATION OF CONFORMITY

Hereby, Haibrain BV, declares that this FD10 is in compliance with the essential requirements and other relevant provisions of the following Directives:

Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility

Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits

Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

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